



SLOVENSKI STANDARD
SIST EN 60436:2020/A12:2023

01-januar-2023

Električni pomivalni stroji za gospodinjstva - Preskusne metode za merjenje lastnosti - Dopolnilo A12

Electric dishwashers for household use - Methods for measuring the performance

Elektrische Geschirrspüler für den Hausgebrauch - Messverfahren für Gebrauchseigenschaften

Lave-vaisselle électriques à usage domestique - Méthodes de mesure de l'aptitude à la fonction

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Ta slovenski standard je istoveten z: EN 60436:2020/A12:2022

ICS:

97.040.40 Pomivalni stroji Dishwashers

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October 2022

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Electric dishwashers for household use - Methods for measuring the performance

Lave-vaisselle électriques à usage domestique - Méthodes de mesure de l'aptitude à la fonction

Elektrische Geschirrspüler für den Hausgebrauch - Messverfahren für Gebrauchseigenschaften

This amendment A12 modifies the European Standard EN 60436:2020; it was approved by CENELEC on 2022-06-06. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 60436:2020/A12:2022) has been prepared by CLC/TC 59X “Performance of household and similar electrical appliances”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-04-14
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2025-10-14

This document amends EN 60436:2020.

It includes the following significant changes:

- editorial improvement regarding consistent use of terms;
- realignment of headings (IEC vs EN);
- more precise description of applicable ambient conditions;
- update of milk preparation procedure;
- guidance on use of plastic fork as soiling tool;
- rounding of reported numbers in alignment with amendment of EU energy labelling and ecodesign regulation;
- necessary change of specified ranges for test load weight;
- update of supplier information annex;
- addition of Annex ZC Test report template;
- withdrawal of corrigendum (change of detergent annex);
- amendment of Annex ZA Measurement procedure for low power modes reflecting learnings of round robin test;
- introduction of dated normative references;
- updated Annexes ZZA and ZZB.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document is read in conjunction with EN 60436:2020/A11:2020 and EN 60436:2020/AC:2020-06.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of Directive(s) / Regulation(s).

EN 60436:2020/A12:2022 (E)

For the relationship with Directive(s) / Regulation(s), see informative Annexes ZZA and ZZB, which are an integral part of this document.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

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1 Replacement of “Introduction”

Replace the Introduction by the following:

“This edition of the standard EN 60436, Electric dishwashers for household use - Methods for measuring the performance, was developed for the EU energy labelling and ecodesign scheme and therefore based on the principle described in the standardization request M/566 to the European Committee for Standardisation, the European Committee for Electrotechnical Standardisation and the European Telecommunications Standards Institute as regards ecodesign and energy labelling requirements for household dishwashers, household washing machines and household washer-dryers in support of Commission Regulations (EU) 2019/2022 and (EU) 2019/2023 and Commission Delegated Regulations (EU) 2019/2017 and (EU) 2019/2014.

Standardization request M/566, issued by the European Commission, includes the standardization task to develop measures in testing household dishwashers, which ensure that the prospective harmonized standard takes into account improved test conditions and test materials to better reflect the user behaviour and the state of the art at European and international level.”

2 Modification of Clause 2 “Normative references”

Replace undated references by dated references:

EN 60704-2-3:2019, *Household and similar electrical appliances - Test code for the determination of airborne acoustical noise - Part 2-3: Particular requirements for dishwashers*

EN 60705:2015¹, *Household microwave ovens – Methods for measuring performance*

EN 60734:2012, *Household electrical appliances - Performance - Water for testing*

EN 50564:2011, *Electrical and electronic household and office equipment - Measurement of low power consumption*

EN 50643:2018, *Electrical and electronic household and office equipment - Measurement of networked standby power consumption of edge equipment*

ISO 607:1980, *Surface active agents and detergents — Methods of sample division*

3 Modifications to Clause 5 “General conditions for measurements”

Modify the first sentence of the first paragraph in 5.5 “Ambient conditions” as follows:

“The following ambient conditions shall be maintained throughout the whole process described in Clause 6 and Clause 7.”

Replace undated reference by dated reference in 5.6.3 “Water hardness” as follows:

EN 60734:2012

Replace undated reference by dated reference in 5.7 “Detergent” as follows:

ISO 607:1980

4 Modifications to Clause 6, “Combined cleaning and drying performance test”

Modify the title of Clause 6 as follows:

“Combined cleaning and drying performance tests”

¹ As amended by EN 60705:2015/A2:2018.

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In 6.4.2.4 “Application”, **modify** the text of the last bullet point as follows:

“Upon removal from the refrigerator, gently shake the milk for approximately 5 s before each application. Immediately after shaking add 10 ml of milk to each glass using a pipette and immediately carry out the cooking process.”

In 6.4.4.3, “Application”, **add** a note at the end of the paragraph:

“

NOTE Alternatives to single-use plastic forks are available. It is expected to use an alternative with soft and flexible prongs to minimize the risk of scratching of dish load items.”

In 6.4.7.3, “Application”, **add** a note at the end of the paragraph:

“

NOTE Alternatives to single-use plastic forks are available. It is expected to use an alternative with soft and flexible prongs to minimize the risk of scratching of dish load items.”

Replace Figure 4, “The thermal cabinet with soiled load items (30 place settings)” with the following:

“

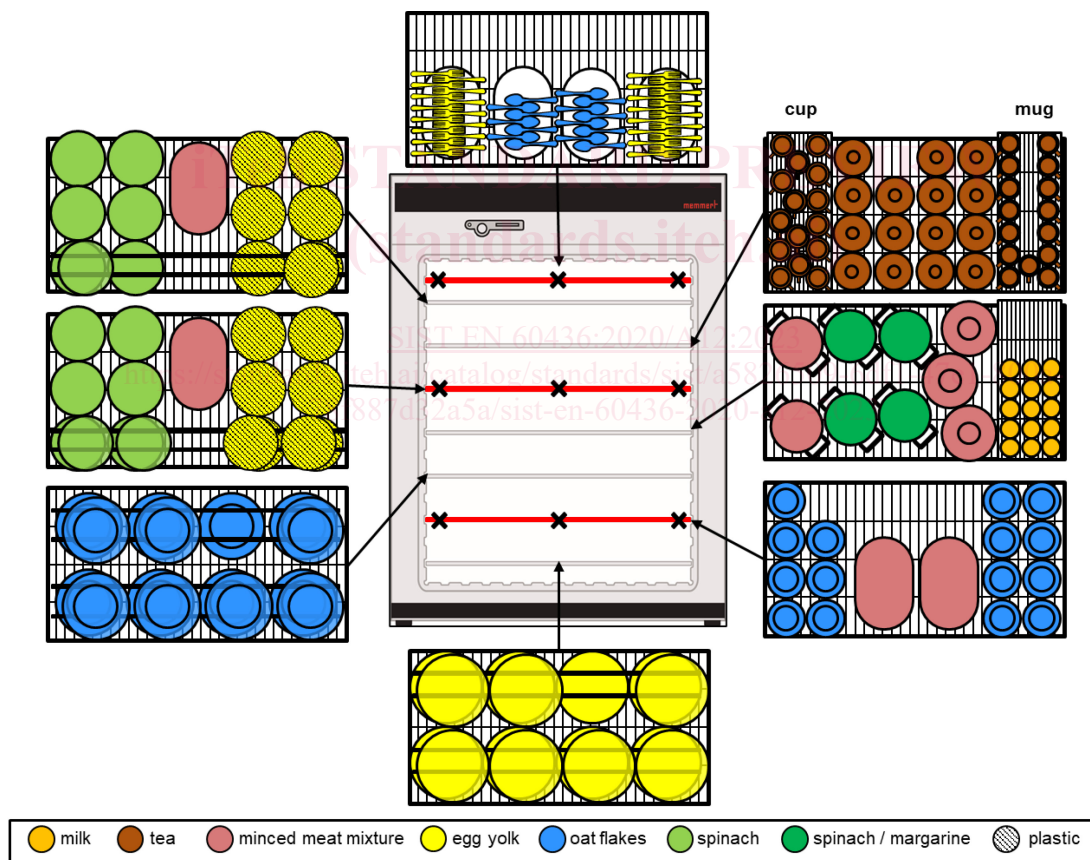


Figure 4 — The thermal cabinet with soiled load items (30 place settings)”

In 6.6.2 “Operating”, **add** a new paragraph following the seventh paragraph:

“For energy labelling and ecodesign purposes filter cleaning during a test series is not permitted.”

5 Modifications to Clause 7, “Combined cleaning and drying performance assessment”

Modify 7.4.1, “Expressing drying results” as follows:

“The final drying result of the **test machine** shall be reported in relation to the **reference machine**. Record the drying performance index for the **test series** P_D [$P_D = \exp(\ln P_D)$] of the **test machine** rounded to 3 decimal places.”

Modify 7.4.2, “Expressing cleaning results” as follows:

“The final cleaning result of the **test machine** is the average of the initial series of **test runs** without filter cleaning, in relation to the **reference machine**. Record the cleaning performance index for the **test series** P_C [$P_C = \exp(\ln P_C)$] of the **test machine**, rounded to 3 decimal places. The filter system is to be declared as **automatic** or **self-cleaning**.

If the **dishwasher** is tested with filter cleaning (see **7.3.4**), the score is the average of the 5 test **cycles**, in relation to the **reference machine**. Record the cleaning performance index for the **test series** P_C [$P_C = \exp(\ln P_C)$] of the **test machine**, rounded to 3 decimal places. The filter system shall be declared as a **manual filter**.”

6 Modifications to Clause 9 “Airborne acoustical noise”

Replace undated reference by dated reference:

“Where an airborne acoustical noise measurement is required, it shall be measured according to EN 60704-2-3:2019.

NOTE Z1 A possible procedure for the statistical determination of declared noise values is described in EN 60704-3:2019.

7 Modification to Annex A, “Place settings and serving pieces”

Modify Table A.1, “Specification of tableware items” as follows:

“

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Table A.1 — Specification of tableware items

Item Id.	Item description	Material	Diameter/ length in mm ^a	Weight in g ^b	Surface colour
Load items type A + type B					
A 1	Dinner plate	porcelain	250	530	white
A 2	Dessert plate	porcelain	190	250	white
A 3	Dessert bowl	Corelle glass	130	118	white
A 4	Mug	porcelain	70	268	white
B 1	Soup plate	porcelain	230	460	white
B 2	Melamine dessert plate	melamine	195	130	white
B 3	Saucer	porcelain	140	140	white
B 4	Cup	porcelain	78	120	white
A 5 + B 5	Glass	borosilicate glass	60	110	transparent
A 6 + B 6	Fork	(18/10) stainless steel	188	41	metallic
A 7 + B 7	Knife	(18/10) stainless steel	209	55	metallic
A 8 + B 8	Soup spoon	(18/10) stainless steel	190	51	metallic
A 9 + B 9	Dessert spoon	(18/10) stainless steel	156	34	metallic
A 10 + B 10	Teaspoon	(18/10) stainless steel	136	23	metallic
Serving pieces					
S 1 a	Small pot	(18/10) stainless steel	160	820	metallic
S 1 b	Oven pot	(18/10) stainless steel	160	475	metallic
S 2	Glass bowl	borosilicate glass	186	330	transparent
S 3	Oval platter	porcelain	320	850	white
S 4	Melamine bowl	melamine	213	170	white
S 5	Serving spoon	(18/10) stainless steel	260	75	metallic
S 6	Serving fork	(18/10) stainless steel	190	35	metallic
S 7	Gravy ladle	(18/10) stainless steel	180	50	metallic
^a A length and diameter tolerance of 2,5 % of the absolute values is acceptable ^b The weight tolerance for single items B4 Cup, A5+B5 Glass and S2 Glass bowl, A7+B7 Knife, S5 Serving Spoon, S6 Serving fork and S7 Gravy ladle shall be within ± 20 % of the absolute values; for all other single items the weight tolerance shall be within ± 10 % of the absolute values.					

Modify Table A.2, "Composition of test loads" as follows:

“

Table A.2 — Composition of test loads

Item No.	Rated dishwasher capacity (place settings): Item description	Number of each type of load item to be included in each test load															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A 1	Dinner plate	0	0	0	2	3	3	4	4	5	5	6	6	7	7	8	8
A 2	Dessert plate	3 ^b	3 ^b	5 ^c	2	3	3	4	4	5	5	6	6	7	7	8	8
A 3	Dessert bowl	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
A 4	Mug	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
A 5	Glass	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
B 5	Glass	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
A 6 + B 6	Fork	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A 7 + B 7	Knife	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A 8	Soup spoon	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8
B 8	Soup spoon	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
A 9 + B 9	Dessert spoon	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A 10 + B 10	Teaspoon	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
B 1	Soup plate	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
B 2	Melamine dessert plate	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
B 3	Saucer	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
B 4	Cup	0	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8
S 1 a	Small pot	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
S 1 b	Oven pot	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
S 2	Glass bowl	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1
S 3	Oval platter	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
S 4	Melamine bowl	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
S 5	Serving spoon	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2	2
S 6	Serving Fork	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
S 7	Gravy ladle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total number of items		14	24	34	47	57	67	77	88	98	108	120	130	140	150	160	170
Total mass of crockery including glasses (kg)		1,25	2,21	3,20	4,47	5,75	6,71	7,98	8,94	10,22	11,18	12,46	13,42	14,69	15,65	16,93	17,89
Total mass of cutlery excluding serving pieces (kg)		0,20	0,41	0,61	0,82	1,02	1,22	1,43	1,63	1,84	2,04	2,24	2,45	2,65	2,86	3,06	3,26
Total mass of serving pieces (kg)		0,26	0,26	0,26	2,08	2,08	2,08	2,08	2,41	2,41	2,41	3,05	3,05	3,05	3,05	3,05	3,05
Total mass of load (kg) ^a		1,71	2,87	4,07	7,36	8,84	10,01	11,49	12,98	14,46	15,63	17,75	18,91	20,39	21,56	23,04	24,20

^a Loads prepared in accordance with this table shall have the mass indicated $\pm 5\%$

^b One dinner plate (A1) and oval platter (S3) is replaced by a dessert plate (A2) each. The respective soil agent and amount for A1 and S3 is applied to the substituted dessert plate(s).

^c Two dinner plates (A1) and one oval platter (S3) are replaced by a dessert plate (A2) each. The respective soil agent and amount for A1 and S3 is applied to the substituted dessert plate(s).

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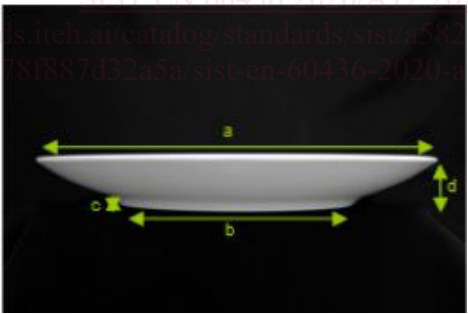
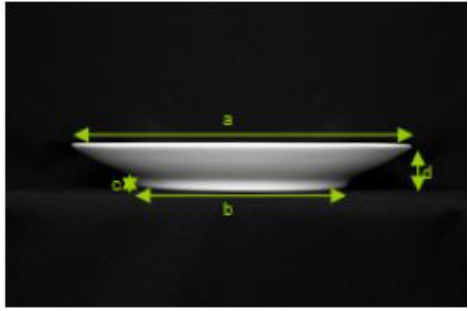
8 Modification to Annex B, “Tableware specifications”



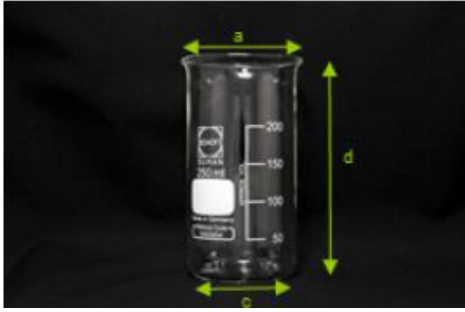
Modify Table B.1, “Tableware specifications” as follows:

“

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Table B.1 — Tableware specifications

Item Id.	Item Description	Photograph	Measured value ^a (a, b, c, d, e, f)	Weight in g ^b	Material thickness bottom	Shape/style ^c	Producer ^c
A 1	Dinner plate		a = 250 mm b = 150 mm c = 2 mm d = 30 mm e = – f = –	530 g	4,4 mm	Form 2000 (Arzberg product number: 20000000226)	Arzberg / Rosenthal
A 2	Dessert plate		a = 190 mm b = 115 mm c = 2 mm d = 24 mm e = – f = –	250 g	3,2 mm	Form 2000 (Arzberg product number: 200000001021 9)	Arzberg / Rosenthal

Item Id.	Item Description	Photograph	Measured value ^a (a, b, c, d, e, f)	Weight in g ^b	Material thickness bottom	Shape/style ^c	Producer ^c
A 3	Dessert bowl		a = 130 mm b = 65 mm c = 5 mm d = 28 mm e = – f = –	118 g	3,8 mm	Corelle 10 oz (Corning/Comcor or product number: 6003899, AHAM)	Corning/ Comcor
A 4	Mug		a = 70 mm b = 35 mm c = 105 mm d = 70 mm e = – f = –	268 g	3,0 mm	Solo 8000 / Aronda 0,30 l	Kahla/Thüringer Porzellan GmbH
A 5 + B 5	Glass		a = 60 mm b = – c = 50 mm d = 120 mm e = – f = –	110 g	3,4 mm	Beaker (250ml)/Tall Form/Without Drain (Schott Duran product number: 211173603)	Schott DURAN